

# HOUSE BILL REPORT

## SHB 1897

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### As Passed Legislature

**Title:** An act relating to the joint center for deployment and research in earth-abundant materials.

**Brief Description:** Creating the joint center for deployment and research in earth-abundant materials.

**Sponsors:** House Committee on Technology & Economic Development (originally sponsored by Representatives Smith, Morris, Tarleton, Young, Hayes, Haler, Sells, Buys, Fagan and Short).

#### **Brief History:**

##### **Committee Activity:**

Technology & Economic Development: 2/10/15, 2/17/15 [DPS].

Appropriations: 2/26/15

##### **Floor Activity:**

Passed House: 6/28/15, 97-0.

Passed Senate: 6/30/15, 43-1.

Passed Legislature.

#### **Brief Summary of Substitute Bill**

- Creates the Joint Center for Deployment and Research in Earth-Abundant Materials as a multi-institutional education and research center under the joint authority of the University of Washington and Washington State University.

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### HOUSE COMMITTEE ON TECHNOLOGY & ECONOMIC DEVELOPMENT

**Majority Report:** The substitute bill be substituted therefor and the substitute bill do pass. Signed by 13 members: Representatives Morris, Chair; Tarleton, Vice Chair; Smith, Ranking Minority Member; DeBolt, Assistant Ranking Minority Member; Fey, Harmsworth, Hudgins, Magendanz, Nealey, Ryu, Santos, Wylie and Young.

**Staff:** Jasmine Vasavada (786-7301).

#### **Background:**

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*This analysis was prepared by non-partisan legislative staff for the use of legislative members in their deliberations. This analysis is not a part of the legislation nor does it constitute a statement of legislative intent.*

In 2011 the United States Department of Energy (DOE) released a report examining the role of rare earth metals and other materials in clean energy technologies, such as wind turbines, electric vehicles, solar cells, and energy efficient lighting. The report found that several clean energy technologies are dependent on one of five rare earth elements that are at risk of supply disruptions in the short term. The DOE listed these materials as 'critical' materials. Two other materials, lithium and tellurium, were identified as being 'near critical' materials.

Rare earth elements (REEs) may be moderately abundant in the earth's crust, but are not concentrated enough to be easily exploited economically. The DOE found that China is the largest supplier of REEs and the United States is heavily import-dependent for a number of critical and near-critical materials. The DOE has recommended strategies to diversify and expand the supply chain, fund research to develop substitutes for critical materials, and reduce waste of critical materials through the development of more-efficient manufacturing processes, recycling, and reuse.

The supply chain includes processing, workforce development, and research and development. The federal government has started to award funding for projects that can enhance the ability of the United States to continue deploying clean technologies and other advanced technologies currently dependent on REEs and other critical materials. The Critical Materials Institute (CMI), facilitated by the Ames National Laboratory, is one example of a concerted local, national, and international effort to address critical materials supply chain issues.

#### **Summary of Substitute Bill:**

The Joint Center for Deployment and Research in Earth-Abundant Materials (JCDREAM) is created. The JCDREAM is a multi-institutional education and research center under the authority of the University of Washington (UW) and Washington State University (WSU). The JCDREAM's purpose is to: (1) establish a transformative program in earth-abundant materials to accelerate the development of next generation clean energy and transportation technologies in Washington; (2) establish a coordinated framework to drive research and deployment of earth-abundant materials and the recycling of advanced materials used in clean technologies; and (3) promote environmentally responsible processes for the manufacturing and recycling of advanced materials.

The JCDREAM is governed by a board of directors (Board) appointed by the Governor, consisting of nine voting members and one chair, who may vote if necessary to break a tie. The Board must include as representatives the following: deans from WSU and the UW; one representative from a regional university; a representative from the Pacific Northwest National Laboratory (PNNL); a community college representative; representatives from large, medium, and small industry companies; one member with experience in national security and energy policy; and one member with experience in innovation and development of policy to address environmental challenges.

The Board must hire an executive director and may hire additional staff. The initial administrative offices must be west of the Cascades. The JCDREAM must make its facilities and resources available to all four-year institutions of higher education. The JCDREAM may

solicit and receive gifts and grants from public and private sources, and such gifts are exempt from certain limitations established in the Ethics in Public Service Act.

The Board's duties include, for example, working with clean technology and transportation industry firms to identify research areas beneficial to Washington's industries, identifying entrepreneurial researchers, and developing internships and other opportunities for students. In addition, the Board shall leverage its financial impact through joint support arrangements and development of nonstate funding sources. The Board must allocate appropriated seed funds for collaboration on research, product development and deployment, and as assistance to community colleges and trade schools for workforce training programs. The Board must develop an operating plan by December 1, 2015, which must include performance metrics to measure total research dollars leveraged, total researchers involved, total workforce trained, and total number of products or processes commercialized and deployed. The Board must, in coordination with the Office of the Governor and the Department of Commerce, submit a biennial report including these metrics to the Legislature and Governor assessing the impact of JCDREAM on the state economy and the development of next generation clean energy and transportation technologies.

**Appropriation:** None.

**Fiscal Note:** Available.

**Effective Date:** The bill takes effect 90 days after adjournment of the session in which the bill is passed.

**Staff Summary of Public Testimony:**

*Public testimony on HB 1897 in House Technology and Economic Development Committee on February 10, 2015.*

(In support) Creation of the JCDREAM addresses the environmentally harmful way in which rare earth elements are mined and the unacceptable strategy of outsourcing the damaging and long-term consequences to global neighbors. It helps prevent the need to maintain a dangerous military presence in regions of instability and conflict. The national dependence on supply chains that can be compromised has long-term consequences to national security goals, energy security, and environmental goals of transitioning to clean technologies. The goal of the JCDREAM is to allow the state and nation to move away from these dependencies to technologies created around earth-abundant resources that can be reliably accessed and acquired through environmentally responsible processes. This can help the state draw national attention and leverage the resources that will be required. Researchers from state universities and the national laboratory can collaborate to help Washington play a leadership role in this transition.

Washington State University has core competencies in advanced materials, engineering, chemistry, and energy research that can be brought to bear in developing clean energy technologies. The JCDREAM establishes a framework for partnership between the UW, WSU, and the PNNL, and forms the basis for a coordinated, integrated effort that differs from the DOE's Critical Materials Institute at Ames National Lab. The JCDREAM is more

focused on the needs of Washington, and in particular, transportation and manufacturing. Several of the DOE reports identified three pillars of a national strategy to address critical material vulnerabilities: (1) diversify supply chains and expand production; (2) develop substitutes for critical materials, using different raw materials; and (3) reduce waste through development of more efficient manufacturing processes, recycling, and reuse.

The research institutions involved in the JCDREAM also promote workforce capability through multidisciplinary programs to further teacher and training in areas such as materials science and engineering. They are top-rated in the world in materials research. Washington State University is home to battery catalysis research in technologies using tin-based electrodes and polymer-based electrolytes to create flexible, safer, and low-cost batteries. Washington State University researchers are finding substitutes for precious metals used in automotive catalytic converters. Consider materials important in the transportation industry: titanium in the aerospace industry, which is lightweight, erosion-resistant, and strong; and aluminum alloys in the automobile industry. These are earth-abundant materials; key to our economy and defense. High production manufacturing processes are necessary to sustain the economy. Geopolitically available sources are important, as is development of new technologies that minimize production waste and allow manufacture with minimal defects.

The PNNL is a DOE laboratory operated by Battelle and focused on fundamental science, energy, environment, and national security. The DOE is trying to remove barriers to development and implementation of clean energy technologies. The PNNL has been involved in developing a road map for the DOE and identified critical materials vulnerabilities as a serious problem. The DOE is coordinating internationally with the European Union and Japan. The PNNL staff have been involved in the CMI. The PNNL does research and development of alternate magnet materials that do not use REEs, or use less REEs, and is working on extraction of critical materials from geothermal brines. Developing materials fast and getting them scalable is crucial to improving Washington's economic competitiveness.

(In support with amendment(s)) Regional universities have special institutes with relevant expertise, and would like to be represented on the JCDREAM Board.

(Opposed) None.

*Public testimony on HB 1897 in House Appropriations Committee on February 26, 2015.*

(In support) National and international leaders in critical materials are located here in Washington. State universities in Washington have expertise in materials substitution, recycling, and battery technology. The Joint Center can leverage new federal dollars as well as private funds. This bill addresses national security and energy sustainability issues, because many technologies considered “green” rely on rare earth elements and other critical materials that may have limited domestic supply or supply chain vulnerability. Mining certain materials abroad outsources the environmental consequences of local choices. Reliance on vulnerable supplies can contribute to military deployment in high-conflict areas.

(Opposed) None.

**Persons Testifying:**

*Persons testifying on HB 1897 in House Technology and Economic Development Committee on February 10, 2015.*

(In support) Representative Smith, prime sponsor; Christian Mailhiot and Ramulu Mamidala, University of Washington; Suresh Baskaran, Pacific Northwest National Lab; and Brian Young, Department of Commerce.

(In support with amendment(s)) Steve DuPont, Central Washington University.

*Persons testifying on HB 1897 in House Appropriations Committee on February 26, 2015.*

Representative Smith, prime sponsor; Chris Mulick, Washington State University; and Patrick Bell, University of Washington.

**Persons Signed In To Testify But Not Testifying:** None.